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Table, Figure 및 결과 작성 요령

제2회 논문작성 워크숍
2014-1-18(토)
연세대 의생명연구센터 1층 유일한홀
교육연수위원회 간사
연세의대 진단검사의학교실
金正浩

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결과 Results

Results

- Provide the results of all end points and measures stated in materials and methods (patients and methods) sections
- The results sections include tables and figures for presenting detailed data and in as compact and readily understood a form as possible and usually devoid of references. The results sections should report the study of your own study only.
  - If no clinically significant changes occur, it is acceptable to state this result not in a tabular format.

Foote M. The Proof of the Pudding How to Report Results and Write a Good Discussion. Chest 2009;135:866-8.
Annesley TM. Show your cards: the results section and the poker game. Clin Chem 2010;56:1066-70.

Presenting Your Result

- **Options for presentation order of results.**
  1. Chronological order
  2. Grouping by topic or experiment
  3. General to specific
  4. Most to least important

Annesley TM. Show your cards: the results section and the poker game. Clin Chem 2010;56:1066-70.

Results

- Data and results are not same.
  - Data are facts and numbers.
  - Results are statements in the main text that summarize or explain what the data show
  - Avoid providing data but no results, or results but no data.
  - Results should be presented in the past tense.

Annesley TM. Show your cards: the results section and the poker game. Clin Chem 2010;56:1066-70.

Results

- When reporting results, just provide the facts
  - Method, study, and experimental details should not be restated in the Results section
  - Discussion and explanation should be in discussion section.
  - In the Results section you can describe what the data show, in the Discussion section you describe what the data mean.

Foote M. The Proof of the Pudding How to Report Results and Write a Good Discussion. Chest 2009;135:866-8.
Annesley TM. Show your cards: the results section and the poker game. Clin Chem 2010;56:1066-70.

Results

- Provide all end points that were listed in the materials and methods section
  - Every method must have a result, and conversely, every result must have a method.
  - **State the Result, the Whole Result, and Nothing but the Result**

Foote M. The Proof of the Pudding How to Report Results and Write a Good Discussion. Chest 2009;135:866-8.
Annesley TM. Show your cards: the results section and the poker game. Clin Chem 2010;56:1066-70.

Reporting guidelines for various types of studies.

- Consolidated Standards of Reporting Trials (CONSORT: www.consort-statement.org/)
- Enhancing the Quality and Transparency of Health Research (EQUATOR; www.equator-network.org/home/)
- Metaanalyses of Observational Studies in Epidemiology (MOOSE; JAMA 2000;283:2008–12)
- Minimum Information about a Microarray Experiment (MIAME; www.mged.org/Workgroups/MIAME/miame_2.0.html)
- Minimum Information for Biological and Biomedical Investigations (MIBBI; mibbi.org/index.php/Main_Page)
- Minimum Information for Publication of Quantitative Real-Time PCR Experiments (MIQE; Clin Chem 2009;55:611–22)
- Preferred Reporting Items for Systematic Reviews and Metaanalyses (PRISMA; www.prisma-statement.org/)
- Standards for the Reporting of Diagnostic Accuracy (STARD; www.stard-statement.org/)
- Strengthening the Reporting of Observational Studies in Epidemiology (STROBE; www.strobe-statement.org/)

Annesley TM. Show your cards: the results section and the poker game. Clin Chem 2010;56:1066-70.

Result

- **"Significance" Is Misused a Significant Amount of the Time**
  - The terms significant, significance, and significantly are used erroneously in many submitted papers.
  - In biomedical publications these terms are intended to identify relationships that have been statistically tested and determined unlikely to have occurred by chance. These terms should also be followed by a mathematical value or limit (e.g., P = 0.067 or P < 0.001).
  - Unless you have such proof of statistical significance, you should use other terms such as ***substantial***, ***considerable***, or ***noteworthy***.
  - Similarly, authors like to draw unwarranted attention to nonsignificant findings by stating that the data "**trended toward**" or "**tended to show**." If the findings are not clear, don't try to imply something about them that cannot be supported.

Annesley TM. Show your cards: the results section and the poker game. Clin Chem 2010;56:1066-70.

Result

- **Consistency of Results with Other Sections**
  - make sure that the Results section is consistent with all of the other sections in the final version of your paper.
  - Is there a result that does not have a corresponding method or experiment in the **Method**s section? Conversely, is there a method or experiment for which you have reported no results?
  - Is there a result not covered in the **Discussion** section, or discussion of a result not contained in the Results section?
  - Are the most important results the same as those highlighted in the **Abstract**?
  - Do the results relate to the study question, hypothesis, or problem first presented in the **Introduction**?

Annesley TM. Show your cards: the results section and the poker game. Clin Chem 2010;56:1066-70.

표와 그림 (Tables and Figures)

- 많은 독자들은 본문을 전부 읽기보다는 먼저 표와 그림을 먼저 보게 된다.
- 표와 그림은 그 자체만으로 표현되어야 한다.
- 자료(data)는 표, 그림, 본문 중 어디에 넣어야 할지 선택되어져야 한다.
- 가급적 표와 그림을 적게 넣어야 한다.

표 Tables

Tables

- Tables are better when the individual or summarized value are more important than trends.
- Table can be used for presenting both quantitative and qualitative data.
- Tables allow side-by-side comparison of data.
- Tables are also good for presenting large amounts of information that would be too cumbersome or confusing to place in the text.

Hamilton CW. On the table: form and function. Chest 2009;135:1087-9.
Annesley TM. Bring your best to the table. Clin Chem 2010;56:1528-34

Table 1. HCV antigen detection by ARCHITECT HCV Ag assay in various genotypes

Genotype	No. of specimens	% detection of HCV Ag	Range of HCV RNA(median)
1b	56	100(56/56)	$5.18x10^3$ -$6.65x10^7$ ($2.26x10^6$)
2	20	100(20/20)	$1.41x10^4$ -$2.29x10^7$ ($1.41x10^6$)
2a/2c	27	88.8(24/27)	$6.02x10^2$ -$1.65x10^7$ ($1.93x10^5$)
2b	5	100(5/5)	$6.07x10^4$ -$8.31x10^6$ ($3.38x10^6$)
3a	1	100(1/1)	$5.90x10^6$

Table 1. HCV antigen detection by ARCHITECT HCV Ag assay in sera with various genotypes of HCV

Geno-type	N of spec-imens	% detection of HCV Ag	HCV RNA median (range) (IU/mL)
1b	56	100 (56/56)	2.26×10^{6} (5.18×10^{3}-6.65×10^{7})
2	20	100 (20/20)	1.41×10^{6} (1.41×10^{4}-2.29×10^{7})
2a/2c	27	88.8 (24/27)	1.93×10^{5} (6.02×10^{2}-1.65×10^{7})
2b	5	100 (5/5)	3.38×10^{6} (6.07×10^{4}-8.31×10^{6})
3a	1	100 (1/1)	5.90×10^{6}
Total	109	97.2 (106/109)	1.53×10^{6} (6.02×10^{2}-6.65×10^{7})

Abbreviation: HCV, Hepatitis C virus.

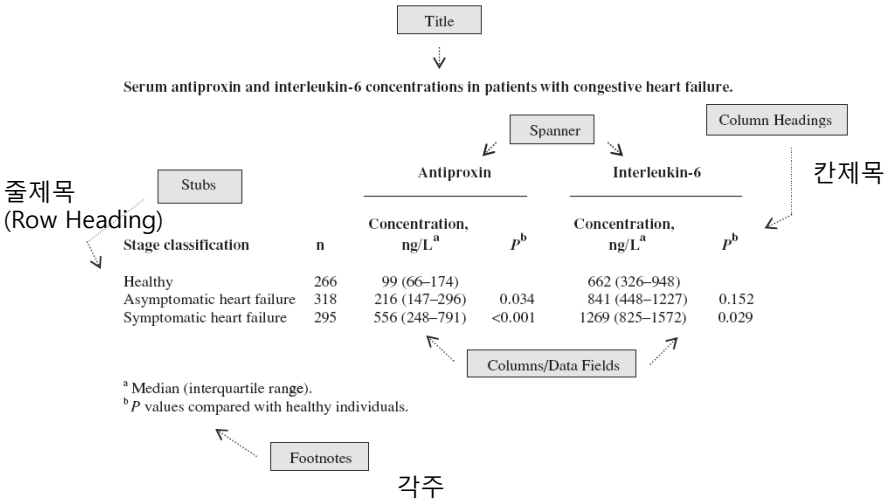
Korean J Lab Med 2010;30:654-9

Tables

- A table should draw attention to the **data** and not the table itself.
- The table should stand alone without the need to refer repeateadly back to the main text.
- Text and tables should complement, not duplicate, one another.

Durbin CG, Jr. Effective use of tables and figures in abstracts, presentations, and papers. Respir Care 2004;49:1233-7.

Major components of a scientific table



Annesley TM. Bring your best to the table. Clin Chem 2010;56:1528-34

Tables

- The title of a table should be sufficiently informative for the reader without having to refer to the paper.
  - Table이나 Figure의 제목 등은 논문의 내용을 읽지 않아도 이해할 수 있도록(self-explanatory) 쓴다.
  - Titles should not include experimental details, data, or result.
  - It should be written as phrases (句節), not sentences (文章).
- Tables should be small as possible.
- Instruction of table creation of Journal of American Medical Assocation is a good example.

Annesley TM. Bring your best to the table. Clin Chem 2010;56:1528-34
AMA, American Medical AssociationInstructions for table creation.

각주 기호 footnote

- Explain all nonstandard abbreviations in footnotes, and use symbols to explain information if needed.
  - Symbols may vary from journal to journal, so check each journal's instructions for authors for required practice.
    - alphabet letter
    - or symbols as * (asterik), † (dagger), ‡ (double dagger), § (secti on mark), || (paragraph mark), ¶ (parallel mark), **, ††, ‡‡, etc.
      - http://www.icmje.org/manuscript_a.html
  - The superscript is usually placed on the right side of a word and should be used in the following order,
    - Examples: not tested*; P<0.05†.
  - Identify statistical measures of variations, such as standar d deviation and standard error of the mean.

- **e. Results**
- Present your results in logical sequence in the text, tables, and figures, giving the main or most important findings first.
- Do not repeat all the data in the tables or figures in the text; emphasize or summarize o nly the most important observations.
- Provide data on all primary and secondary outcomes identified in the Methods Section.
- Extra or supplementary materials and technical details can be placed in an appendix wh ere they will be accessible but will not interrupt the flow of the text, or they can be publ ished solely in the electronic version of the journal.
- Give numeric results not only as derivatives (for example, percentages) but also as the a bsolute numbers from which the derivatives were calculated, and specify the statistical si gnificance attached to them, if any.
- Restrict tables and figures to those needed to explain the argument of the paper and to assess supporting data.
- Use graphs as an alternative to tables with many entries; do not duplicate data in graph s and tables. Avoid nontechnical uses of technical terms in statistics, such as "random" (which implies a randomizing device), "normal," "significant," "correlations," and "sample."
- Separate reporting of data by demographic variables, such as age and sex, facilitate poo ling of data for subgroups across studies and should be routine, unless there are compe lling reasons not to stratify reporting, which should be explained.

Gridlines in Tables

Table 2. Relationship between DSA at the time of transplantation and biopsy-proven acute rejection

	DSA (+) (N = 16)	DSA (–) (N = 11)*	*P*
AR	9 (56.3%)	0 (0.0%)	0.003
AMR ± ACR	5 (31.3%)	0 (0.0%)	0.060
ACR only	4 (25.0%)	0 (0.0%)	0.123
1-yr GS	14/15 (93.3%)	11/11 (100.0%)	1.000
3-yr GS	5/6 (83.3%)	7/7 (100.0%)	0.462

*One case in the DSA (–) group was excluded, because graft loss within 24 hr of transplantation was due to clinically suspected vascular problem rather than antibody-mediated hyperacute rejection.
Abbreviations: DSA, donor-specific HLA antibodies; AR, acute rejection; ACR, acute cellular rejection; AMR, antibody-mediated rejection; GS, graft survival.

Original Article
Diagnostic Immunology
Ann Lab Med 2012;32:139-144
http://dx.doi.org/10.3343/alm.2012.32.2.139
ISSN 2234-3806 eISSN 2234-3814
ANNALS OF LABORATORY MEDICINE

- **Gridlines** can be helpful in working tables, but final tables in manuscripts, posters, and slides should have only three horizontal lines, one each below the title, the column heads, and the data field.

Evans D. Tables and graphs. In: Minick P, ed. Biomedical communication: selected AMWA workshops. Rockville, MD: American Medical Writers Association, 1994; 38–47

Checklists for Good Tables

- Convey important information more efficiently than text and complement (without duplicating) the text
- Make a clear point and be as simple as possible.
- Be organized logically and sequentially (alphabetically or chronologically)
- Be self-explanatory an include definitions for all abbreviations;
- Have a short, specific, descriptive title
- Adhere to the instructions for authors fo the journal
- Be created with the table editor of word-processing software
- Be edited for accuracy, understandability, and consistency.

Hamilton CW. On the table: form and function. Chest 2009;135:1087-9.

Checklists for Good Tables

- SI units are recommended, mandatory in many journals. We can provide conversion factors to the seconary (i.e. conventional) units in footnotes.
- If you have mising data or no applicable entry for a data field, do not leave the space balnk, but insert an em dash (—) or a horizontal ellipse (…) to designate that no data are available.
- Each foonote should be placed on as a seprate line at the bottom of the table.

Hamilton CW. On the table: form and function. Chest 2009;135:1087-9.

Options for displaying annual per capita healthcare expenditures

A. Annual per capita healthcare expenditures.

	Expenditure, $
Israel	1971
Madagascar	36
Sweden	2828
Yemen	82
Zimbabwe	149

B. Annual per capita healthcare expenditures.

	Expenditure, $
Israel	1971
Madagascar	36
Sweden	2828
Yemen	82
Zimbabwe	149

Annesley TM. Bring your best to the table. Clin Chem 2010;56:1528-34

Options for displaying annual per capita healthcare expenditures

C. Annual per capita healthcare expenditures.

	Expenditure, $
Sweden	2828
Israel	1971
Zimbabwe	149
Yemen	82
Madagascar	36

Annesley TM. Bring your best to the table. Clin Chem 2010;56:1528-34

Table 2. Long-term outcomes according to cystatin C tertile.[a,b]

	Cystatin C tertile			
	First tertile: <0.86 mg/L (n = 378)	Second tertile: 0.86–1.01 mg/L (n = 365)	Third tertile: >1.01 mg/L (n = 385)	Log-rank *P*
Death within 4 years	3.4% (12)	6.2% (21)	13.5% (48)	<0.001
Spontaneous MI within 3 years	5.5% (19)	7.5% (22)	9.8% (36)	0.03
Procedure-related MI within 3 years	8.0% (30)	11.8% (43)	7.9% (30)	0.10
MI (spontaneous or procedure-related) within 3 years	12.6% (46)	18.1% (61)	16.3% (61)	0.17

[a] Data are presented as percentages from Kaplan–Meier curves at long-term follow-up; the number of events is in parentheses.
[b] Table from Clin Chem 2009;55:1118–25. Used with permission.

Annesley TM. Bring your best to the table. Clin Chem 2010;56:1528-34

General rule of table alignment

- The stubs should all be left justified.
- In the columns/data fields, words should be left justified, and whole numbers should be right justified.
- Data fields containing decimal points, plus/minus symbols, slashes, hyphens, or parentheses should be alighned on these elements.
- When the text in a stub wraps to a second line, the corresponding data field should align with the top line of the stub.

Annesley TM. Bring your best to the table. Clin Chem 2010;56:1528-34

Table 3. Phenytoin concentrations measured by immunoassay for matrices supplemented with 10 mg/L phenytoin.

	Mean (SD), mg/L	Mean ± SD, mg/L	Deviation from target, %
Pig serum	11.4 (2.1)	11.4 ± 2.1	14
Sheep serum	10.7 (1.4)	10.7 ± 1.4	7
Artificial serum	10.3 (0.8)	10.3 ± 0.8	3
Saline	10.1 (0.6)	10.1 ± 0.6	1
Human serum	9.9 (0.6)	9.9 ± 0.6	−1
Cow serum	9.6 (1.4)	9.6 ± 1.4	−4
Horse serum	8.9 (0.7)	8.9 ± 0.7	−11

Annesley TM. Bring your best to the table. Clin Chem 2010;56:1528-34

Two ways to list the top 10 states for air quality.

A. States with the 10 highest air quality indices.	B. States with the 10 highest air quality indices.
Idaho	Alaska
North Dakota	Hawaii
Montana	Idaho
Alaska	Minnesota
Minnesota	Montana
Hawaii	New Mexico
New Mexico	North Dakota
Wisconsin	South Dakota
South Dakota	Tennessee
Tennessee	Wisconsin

Annesley TM. Bring your best to the table. Clin Chem 2010;56:1528-34

Table 5. Age-related 5-year survival for forms of acute myelogenous leukemia.

Age, years	Undifferentiated leukemia, %	Myeloblastic leukemia, %	Promyelocytic leukemia, %	Myelomonocytic leukemia, %	Monocytic leukemia, %	Erythroleukemia, %	Microkaryoblastic leukemia, %	Megakaryoblastic leukemia, %
<21	91	80	85	81	82	73	62	52
21–40	89	83	79	77	68	61	57	41
41–60	74	62	68	59	40	37	31	24
>60	51	48	39	34	28	21	16	9

Annesley TM. Bring your best to the table. Clin Chem 2010;56:1528-34

be 60 characters and spaces in a row for a table running across half a page and 120 characters and spaces for a table running the full width of a page. For a 2-column journal such as *Clinical Chemistry*, a table width of 110 characters and spaces would fit onto a portrait-formatted page. Otherwise, a journal might consider publishing the table in landscape format (sideways), but this formatting is awkward for the reader and just does not look as nice on the page (Tables 5 and 6).

Fortunately, there are several ways to condense the size of a table. One is to reorient the table so that the variables are reversed in the table *(6, 7)*, as shown in Table 7. This table contains the same data as Table 5 but uses half the width. It also fits a portrait layout on the journal page. If the ratio of the number of column headings to row headings is greater than 2:1, you should evaluate whether reorienting the table would allow a better presentation of the data *(6)*.

Another option is to evaluate whether all of the columns or rows are necessary in a table and whether any nonessential data can be removed. In Table 6, for example, are all of the data and text in the first 3 columns necessary? Will the first author and reference number suffice to identify the studies? Is there a strong reason (e.g., the differences in the number of patients are critical to your discussion) to include the number and sex of the patients if the same information can be found in the reference? Isn't the initial value for a variable, such as the leukocyte count, typically considered 100%? Condensing column 1 and removing columns 2 and 3 yield a table (Table 8) that is narrower and looks cleaner on the printed page. Other columns of data that could be removed and explained in a footnote include those that contain a single data point, a column in which all of the values are the same, or a column in which only 1 or 2 of multiple values differ from the others (e.g., 9 positives and only 1 negative). If a column contains a series of *P* values with only 1 or 2 being statistically significant, this column could be replaced with superscripted letters or symbols after the values, with the significant differences and explanations presented in footnotes.

The use of abbreviations instead of longer names also can reduce the width of a table substantially. Journals allow more leeway in the use of abbreviations in tables because the definitions can be provided in footnotes. As an example of this approach, one could try to abbreviate the types of acute myelogenous leukemia in Table 5 (e.g., UL, undifferentiated leukemia: MML, myelomonocytic leukemia; EL, erythroleukemia). Try this, and see how much this table could be condensed by doing so.

If you have data that could be removed from a large table but are of consequence for the reader to best understand your message, consider placing the most

Table 5. Age-related 5-year survival for forms of acute myelogenous leukemia.

Age, years	Undifferentiated leukemia, %	Myeloblastic leukemia, %	Promyelocytic leukemia, %	Myelomonocytic leukemia, %	Monocytic leukemia, %	Erythroleukemia, %	Microkaryoblastic leukemia, %	Megakaryoblastic leukemia, %
<21	91	80	85	81	82	73	62	52
21–40	89	83	79	77	68	61	57	41
41–60	74	62	68	59	40	37	31	24
>60	51	48	39	34	28	21	16	9

Annesley TM. Bring your best to the table. Clin Chem 2010;56:1528-34

Table 7. Age-related 5-year survival for forms of acute myelogenous leukemia (AML).

	Age			
AML type	<21 Years	21–40 Years	41–60 Years	>60 Years
Undifferentiated, %	91	89	74	51
Myeloblastic, %	80	83	62	48
Promyelocytic, %	85	79	68	39
Myelomonocytic, %	51	48	39	34
Monocytic, %	82	68	40	28
Erythroleukemia, %	73	61	37	21
Microkaryoblastic, %	62	57	31	16
Megakaryoblastic, %	52	41	24	9

Annesley TM. Bring your best to the table. Clin Chem 2010;56:1528-34

Keep your tables small!! (1)

- The maximal width should be 60 charactes and spaces in a row for a table running across half a page and 120 characters and spaces for a table running the full width of a page.
  - Some journal limit the number of columns to 10.
- We should consider portrait-formatted page vs landscape format (sideways).
- Reorient the table the variables are reversed, when the ratio of the number of column heading to row headings is greater than 2:1.

Hamilton CW. On the table: form and function. Chest 2009;135:1087-9.

Table 6. Previous studies of leukocyte reduction during kelvac therapy in patients with chronic myelogenous leukemia.

Study	No. of patients	Leukocyte count, %[a]						
		Day 0	Day 7	Day 14	Day 21	Day 28	Day 56	Day 84
Wilkins and Potter, Ref[b] 11	M11;F11	100	97	—	84	—	—	70
Pillsbury et al., Ref 12	M10;F18	100	100	81	—	76	—	64
Annesley et al., Ref 18	M27;F20	100	89	76	—	63	—	62
Kronnenberg and Stenmeyerson, Ref 20	M9;F7	100	103	95	—	88	69	—
Flowers and Peterson, Ref 25	M20;F23	100	101	96	93	89	86	98
Flloyd et al., Ref 26	M27;F23	100	95	—	—	91	—	79
Robinson et al., Ref 27	M19;F20	100	—	100	—	96	—	94
Nowicki and Phillips, Ref 32	M15;F16	100	—	92	—	82	74	—

[a] Percentage of initial value at start of treatment.
[b] Ref, reference; M, male; F, female.

Annesley TM. Bring your best to the table. Clin Chem 2010;56:1528-34

Table 8. Previous studies of leukocyte reduction during kelvac therapy in patients with chronic myelogenous leukemia.

Study (reference)	Leukocyte count, %[a]					
	Day 7	Day 14	Day 21	Day 28	Day 56	Day 84
Wilkins *(11)*	97	—	84	—	—	70
Pillsbury *(12)*	100	81	—	76	—	64
Annesley *(18)*	89	76	—	63	—	62
Kronnenberg *(20)*	103	95	—	88	69	—
Flowers *(25)*	101	96	93	89	86	98
Flloyd *(26)*	95	—	—	91	—	79
Robinson *(27)*	—	100	—	96	—	94
Nowicki *(32)*	—	92	—	82	74	—

[a] Percentage of initial value at start of treatment.

Annesley TM. Bring your best to the table. Clin Chem 2010;56:1528-34

Keep your tables small!! (2)

- Evaluate whether all of the columns or rows are necessary in a table and whether any nonessential data can be removed.
- Use of abbreviations instead of longer names also cannot reduce the width of a table substantially.
- Many journals make use of these supplemental electronic files as a way to optimize the use of an article's allotted page space.
- Sometimes the best option is to split a large table into 2 separate tables.

Hamilton CW. On the table: form and function. Chest 2009;135:1087-9.

Learning exercise for a table

Table 9. Effect of tacrolimus or sirolimus on everolimus measurement.

Specimen	Measured concentration	Bias, %	P^a
Blood + 10.0 μg/L everolimus	9.9 μg/L	−1	
Blood + 10.0 μg/L everolimus + 10.0 μg/L tacrolimus	10.5 μg/L	5	0.052
Blood + 10.0 μg/L everolimus + 10.0 μg/L sirolimus	14.3 μg/L	43	<0.001

[a] *P* value compared with everolimus alone. $P < 0.05$ considered significant.

Annesley TM. Bring your best to the table. Clin Chem 2010;56:1528-34

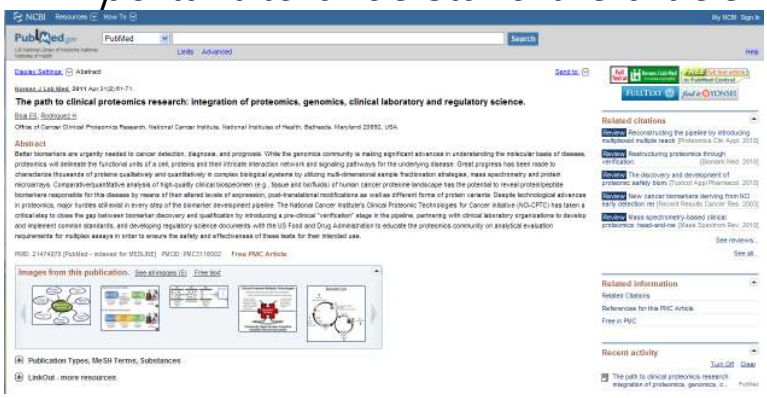
Answers to Learning Exercise

1. The title would be more informative if it included the analytical technique or assay used.
2. An em dash may be added to the last column.
3. Because the unit of measure is the same for each concentration measured, it could be presented once after the corresponding column heading.
4. The numbers, including the *P* values, should be aligned on the decimal point.
5. The information in the stubs for the second and third rows wraps to a second line. The data in the column entries should be aligned with the top line of the corresponding stub.
6. Because only 1 *P* value is statistically significant, one could remove the last column and provide the same information in a footnote.

Annesley TM. Bring your best to the table. Clin Chem 2010;56:1528-34

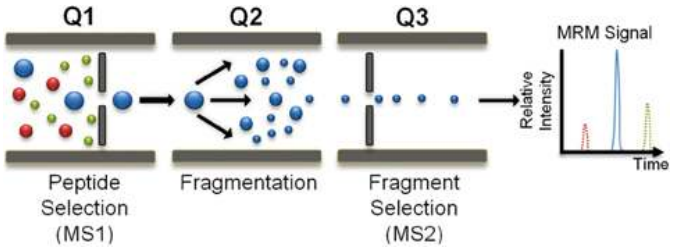
그림 Figures

Pictures,
important to understand the article



- US National Library of Medicine is currently showing images in each abstract webpage of each PMC (pubmed central) article, if available.

Figures



- Multiple Reaction Monitoring Mass Spectrometry (MRM-MS). *Korean J Lab Med. 2011 Apr;31(2):61-71.*

- *A picture is worth a thousand words!*
一畫勝千言

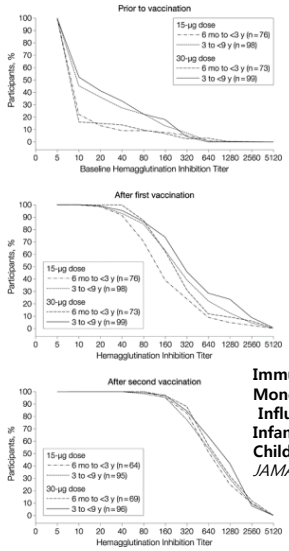
Figures

- Most figures are used in the Methods and Results sections
  - **Methods section**: to clarify or amplify the methods
  - **Results section**: present evidence that supports the results

Graphs

- **Graphs** have an immediate visual impact and are good for showing trends or patterns or for highlighting differences between sets of data.
- Although the data in a graph are quantitative, a graph does not work well when the exactness or precision of the data is important.

Annesley TM. Bars and pies make better desserts than figures.Clin Chem 2010;56:1394-400



Immunogenicity of a Monovalent 2009 Influenza A(H1N1) Vaccine in Infants and Children: A Randomized Trial
JAMA. 2010;303(1):37-46.

Figure Types

- Statistical graphs
- Charts
- Diagrams
  - realistic or schematical

- photogrpahic images (color photos, radiogrpahs, ultrasound images, electron micrographs),
- Illustrations,
- Videos

Graphs

- **Graphs** have an immediate visual impact and are good for showing trends or patterns or for highlighting differences between sets of data.
- Although the data in a graph are quantitative, a graph does not work well when the exactness or precision of the data is important.
- **Bar graphs** are useful for the **visual comparison of data** or for **showing trends** in data and are most informative when you are more interested in the actual value of a variable than its confidence interval.
- **Bar grpah** or **pie chart** must not only present the data but also be easily understood without having to refer repeatedly back to the main text.

Annesley TM. Bring your best to the table. Clin Chem 2010;56:1528-34
Annesley TM. Bars and pies make better desserts than figures.Clin Chem 2010;56:1394-400

Basics of a Good Graph

- It draws attention to the data and not the graph itself.
- The data points (symbols) and connecting lines are easy to read and distinguish.
- Both the numbers and labels for the axes are readable and their meaning is clear.
- The lengths of the 2 axes are visually balanced (ratio of *x* axis to *y* axis = 1.0 to 1.3).
- The scales used on each axis match the range of the data.
- Tick marks are used appropriately.
- The legend is clear and concise.
- The reader can understand the message without referring back and forth to the main text.
- The data deserve to be graphed.

Annesley TM. Put your best figure forward: line graphs and scattergrams. Clin Chem 2010;56:1229-33.

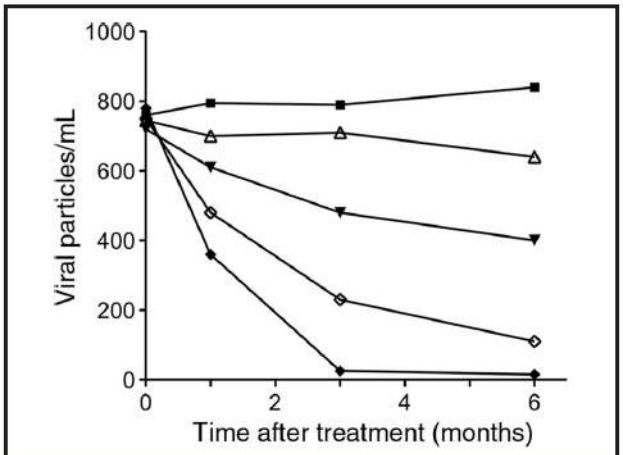
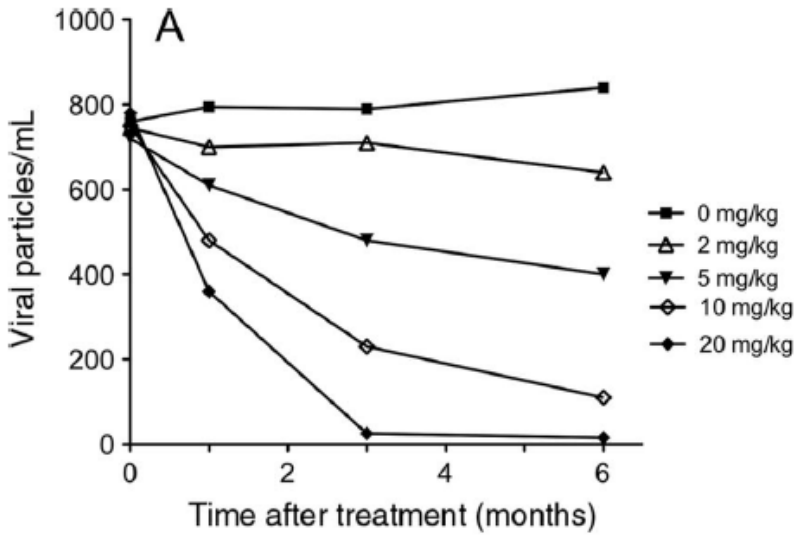
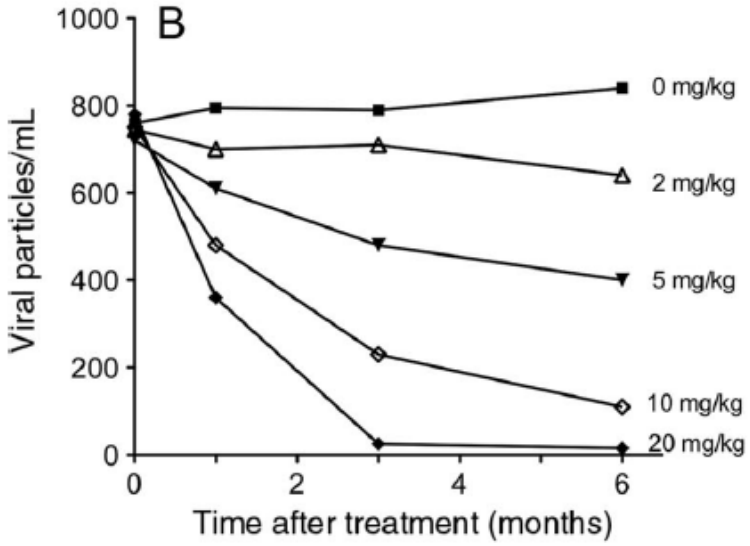


Fig. 1. Change in blood viral load during daily oral treatment with albenovir; ■, 0 mg/kg; △, 2 mg/kg; ▼, 5 mg/kg; ◇, 10 mg/kg; ◆, 20 mg/kg.

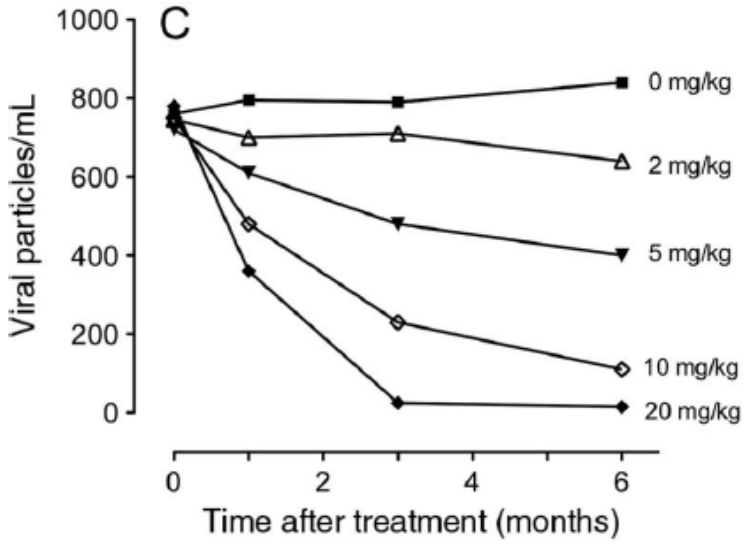
Clin Chem 2010;56:1229-33.



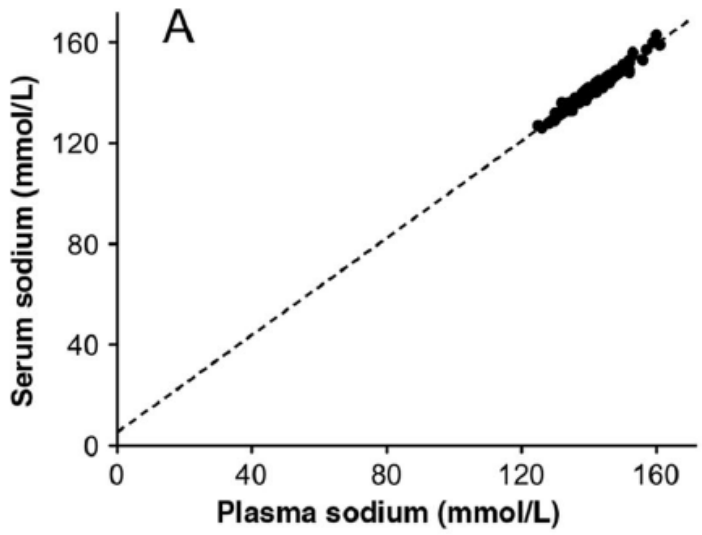
Clin Chem 2010;56:1229-33.



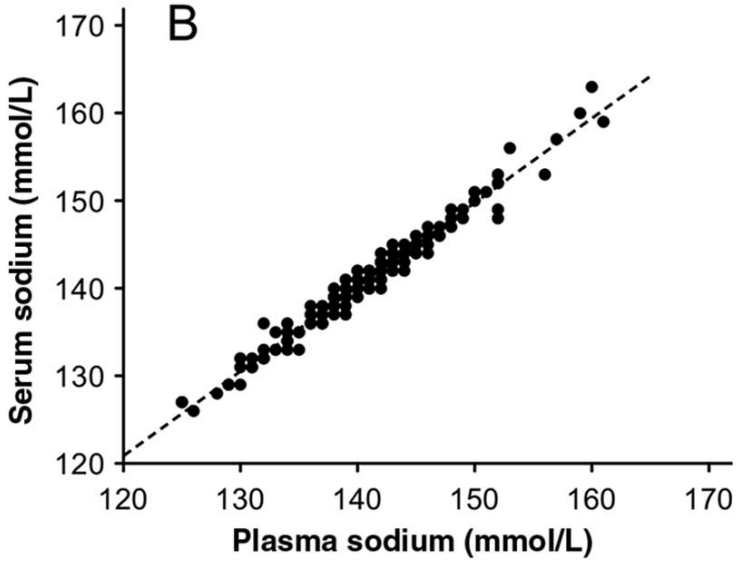
Clin Chem 2010;56:1229-33.



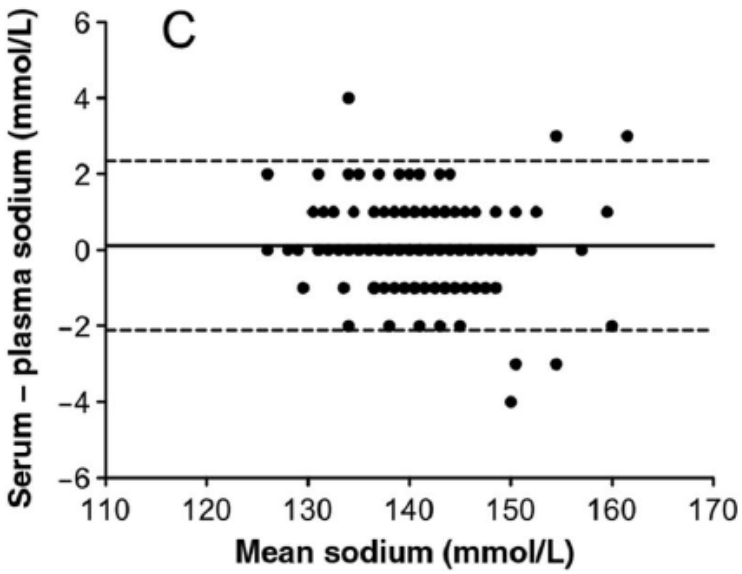
Clin Chem 2010;56:1229-33.



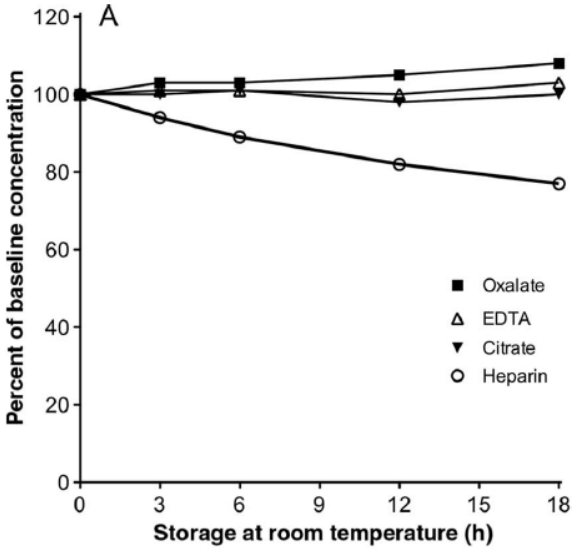
Clin Chem 2010;56:1229-33.



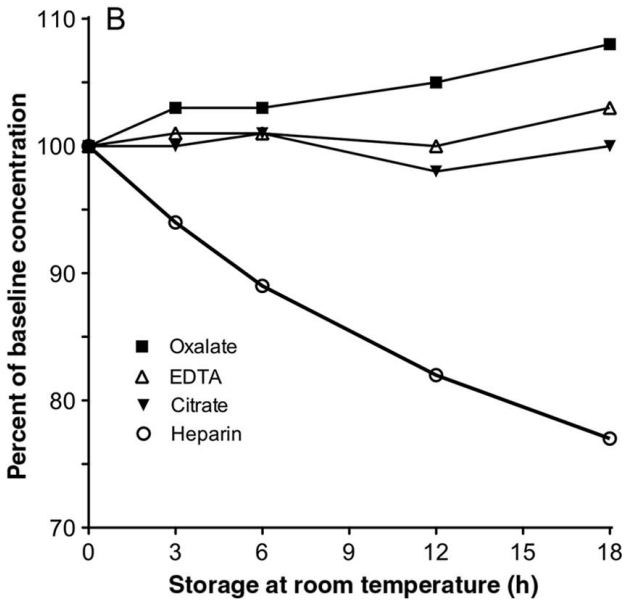
Clin Chem 2010;56:1229-33.



Clin Chem 2010;56:1229-33.



Clin Chem 2010;56:1229-33.



Clin Chem 2010;56:1229-33.

Learning exercise – Fig. 6

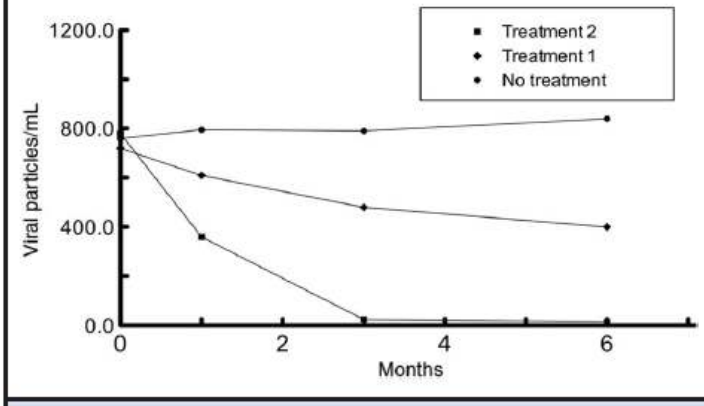


Fig. 6. Change in viral load during treatment; ●, 0 mg/kg; ♦, 5 mg/kg; ■, 20 mg/kg.

Clin Chem 2010;56:1229-33.

Answer to Learning Exercise -Problems with Fig. 6- (1)

- The symbols are too small.
- The symbols are too similar (solid box, solid circle, solid diamond) and are difficult to distinguish.
- The data-connecting lines are narrow and do not draw attention to the data.
- The text in the labels is small.
- The *x and y axes are too wide and draw the focus away from the data.*
- The numbers on the axes are proportionately too large.
- The numbers on the axes are 2 different font sizes.
- The *y-axis numbers have an unnecessary decimal point.*
- The scale for the *y axis is too large and creates wasted space*.

Clin Chem 2010;56:1229-33.

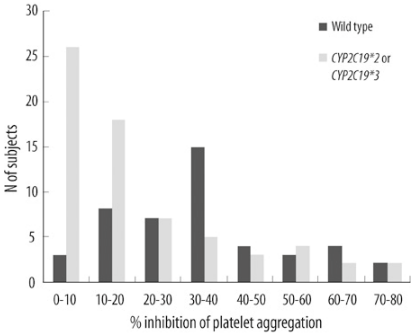
Answer to Learning Exercise -Problems with Fig. 6- (2)

- The *x axis says "months" and a fuller description may alleviate the need for the reader to refer to the main text.*
- The tick marks are on the inside of the axes and hide the symbols.
- The ratio of the *x axis to the y axis is too large (ideally 1.0 to 1.3)*
- The symbol legend within the graph identifies different treatments, whereas the figure legend identifies milligram per kilogram doses.
- The symbol order (top to bottom) in the legend within the graph is different from the order (top to bottom) of the actual symbols in the figure.

Clin Chem 2010;56:1229-33.

Bar Graphs

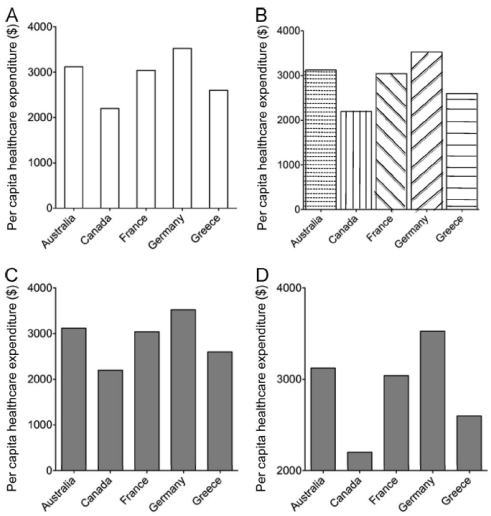
- **Bar graphs** are useful for the **visual comparison of data** or for **showing trends** in data and are most informative when you are more interested in the actual value of a variable than its confidence interval.
- **Bar grpah** or **pie chart** must not only present the data but also be easily understood without having to refer repeatedly back to the main text.



Comparison of the percentage inhibition of platelet aggregation and CYP2C19 Polymorphisms.
Korean J Lab Med. 2011 Apr;31(2):91-94

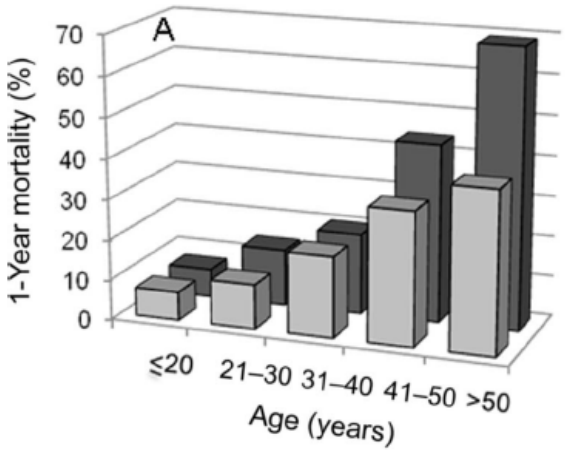
Annesley TM. Bars and pies make better desserts than figures.Clin Chem 2010;56:1394-400

Examples of Bar graph for "Per capita healthcare expenditures for 5 industrialized countries with medium-sized populations"



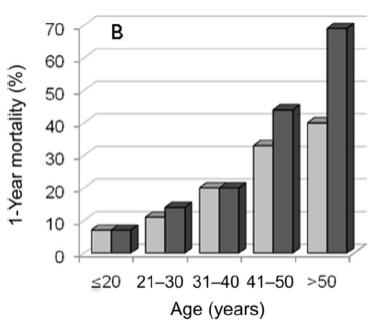
Annesley TM. Clin Chem 2010;56:1394-1400.

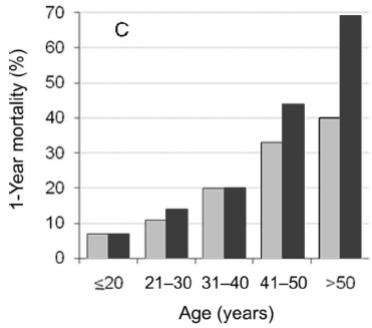
Examples of Bar graph for "One-year mortality vs age for patients diagnosed with a disease. "



Indicated are data for men (□) and women (■).
Annesley TM. Clin Chem 2010;56:1394-1400.

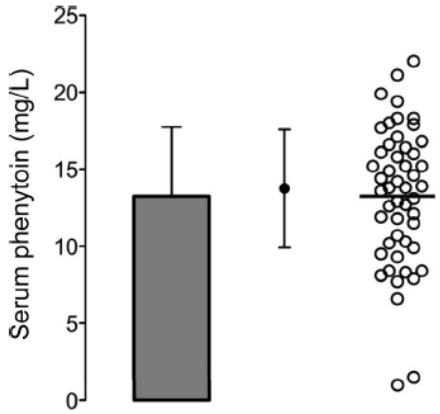
Examples of Bar graph for "One-year mortality vs age for patients diagnosed with a disease."





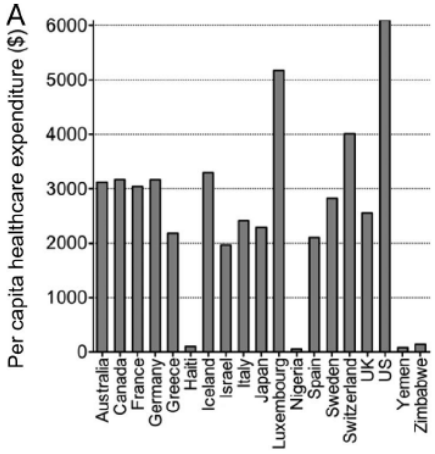
Indicated are data for men (□) and women (■).
Annesley TM. Clin Chem 2010;56:1394-1400.

Trough serum phenytoin concentrations for 36 pediatric patients receiving a dosage of 6 mg • kg^{-1} • day^{-1}.



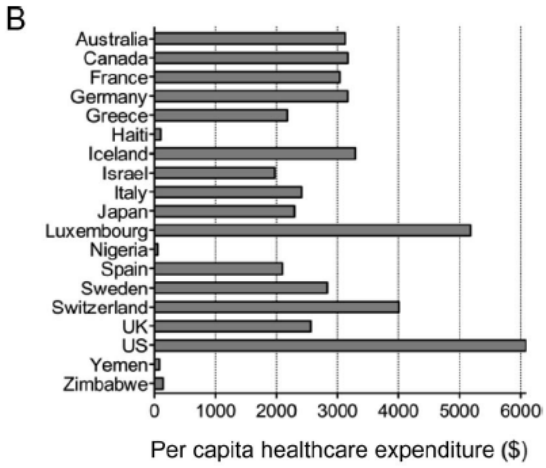
Annesley TM. Clin Chem 2010;56:1394-1400.

Per capita healthcare expenditures for 19 countries or unions participating in an economic survey



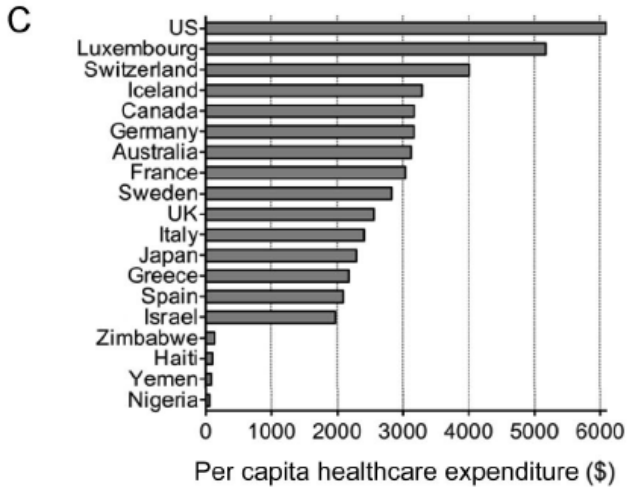
Annesley TM. Clin Chem 2010;56:1394-1400.

Per capita healthcare expenditures for 19 countries or unions participating in an economic survey



Annesley TM. Clin Chem 2010;56:1394-1400.

Per capita healthcare expenditures for 19 countries or unions participating in an economic survey



Annesley TM. Clin Chem 2010;56:1394-1400.

Pie chart & learning exercise

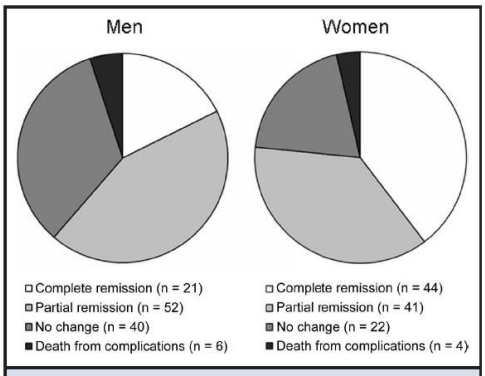
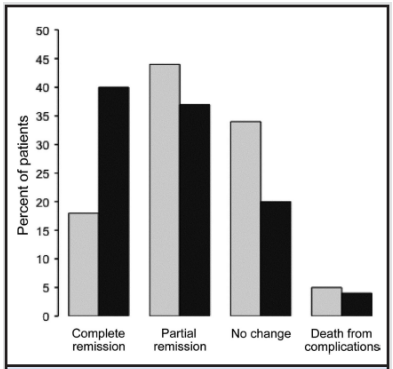


Fig. 6. One-year follow-up status of patients with acute lymphoblastic leukemia treated with a combination of vincristine and cytarabine.

All of the available data are included, and the total number in each group is provided.

Annesley TM. Clin Chem 2010;56:1394-1400.

Answer to learning exercises (1)

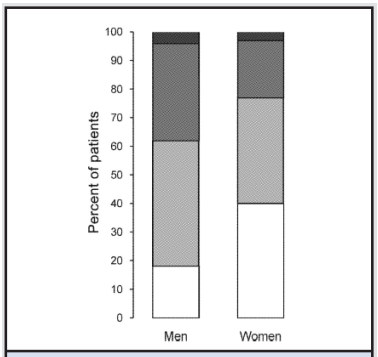


Example 1. One-year status of patients with acute lymphoblastic leukemia treated with vincristine plus cytarabine.
Men (□), n = 119; women (■), n = 111.

- Because the numbers of men (n 119) and women (n 111) differ, the best way to compare outcomes is to plot the percentages of men or women in each response category. It is also important to include the number of patients on the graph or in the legend.
- Example 1 is a clustered bar graph, in which the *categories* are plotted on the horizontal axis. The pattern of response rates is easy to see and compare for both sexes. When fewer than 3 groups are included, clustered bar graphs are better for showing trends and allow group comparisons.

Annesley TM. Clin Chem 2010;56:1394-1400.

Answer to learning exercises (2)



Example 2. One-year status of patients with acute lymphoblastic leukemia treated with vincristine plus cytarabine.
□, complete remission; ▨, partial remission; ▩, no change; ■, death from complications. Men, n = 119; women, n = 111.

- Example 2 is a stacked bar graph, in which the *groups* are plotted on the horizontal axis.
- Because stacked bar graphs must add up to 100%, they have the same characteristics as pie charts. When 3 groups are compared, a stacked bar graph may be easier to understand, especially if there is a natural order to the categories. This consideration is a good reason to plot your data several ways and then decide on the format that most clearly presents your message.

Annesley TM. Clin Chem 2010;56:1394-1400.

Well-chosen words can replace a picture!

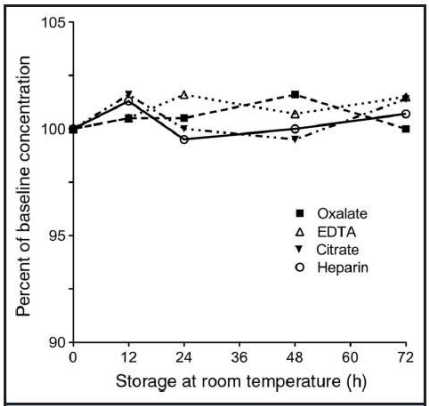


Fig. 5. Percent change in whole-blood tacrolimus concentration after storage at room temperature.

- The message can be conveyed just as easily in the main text: "When whole blood specimens were collected into oxalate, EDTA, citrate, or heparin containing tubes, and stored at room temperature for up to 72 hours, no statistically significant change in the tacrolimus concentration was observed for any of the tube types."

Annesley TM. Put your best figure forward: line graphs and scattergrams. Clin Chem 2010;56:1229-33.

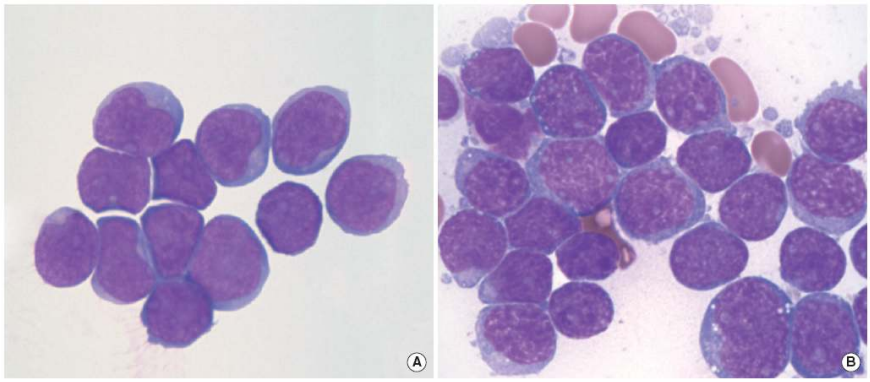


Fig. 1. Morphology of the leukemic blasts in the cerebrospinal fluid at first relapse (A) and in the bone marrow at second relapse (B) (Wright-Giemsa stain, ×1,000).

290 www.annlabmed.org http://dx.doi.org/10.3343/alm.2012.32.4.289

현미경 사진일 경우 촬영배율 또는 자를 삽입하여
크기를 알 수 있게 하고 염색방법을 기입한다.

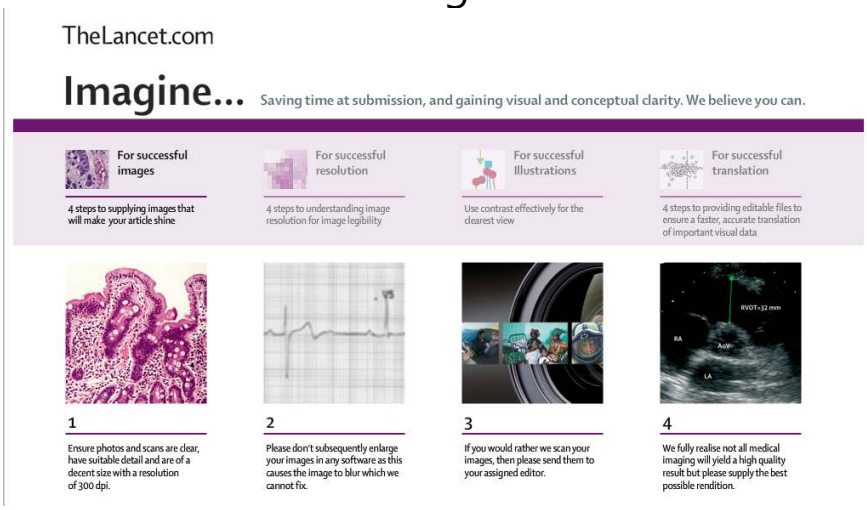
Figures

- Image Size
  - Minimum image width: 5 inches (depth is not important).
- Color Mode.
  - Original RGB color mode for color photographs and photomicrographs. Digital cameras capture images in RGB. Do not change any color settings once the file is on the computer.
  - Do not submit in sRGB or webRGB color modes since this will adversely affect the color of your image.
  - Grayscale mode for black and white photographs such as radiographs, ultrasound images, CT scans, MRI scans, and electron micrographs.
- Resolution:
  - Minimum resolution: approximately 350 ppi. For reference, the resolution of most Web images is 72 ppi.
- File Formats.
  - Preferred File Formats (raster files): EPS, JPG (highest quality, least compression), PSD, TIF (no compression enabled). Author should understand that there may be unacceptable photomicrophic image file formats such as BMP, GIF, PCT, and PNG, to some specific journals.

Figures

- **BMP:**Windowsbitmap,the fileformatbuilt into Windows and native to Microsoft Paint; supports 1-24 bit depth and index color.
- **dpi/ppi:** dpi stands for dots per inch; it refers to a measurement of output device
- resolution; ppi stands for pixels per inch; it refers to units of measurement for digital images. The terms dpi and ppi are often used interchangeably.
- **GIF:** Graphics Interchange Format, a lossy compression algorithm; supports 1-8 bit
- depth, 256 index color only; suitable primarily for Web images.
- **Raster:** A digitized image that is mapped into a grid of pixels; therefore, the
- image is resolution-dependent; the color of each pixel is defined by a specific number of bits.
- **RGB:** An additive color model based on red (R), green (G), and blue (B) light; RGB
- is used by computers, televisions, and film recorders to display colors; mixing equal amounts of red, green, and blue light will produce white light.
- **sRGB:** A color profile with a very limited amount of color values, primarily designed for vivid images displayed over the Internet. Not suitable for print reproduction.
- **webRGB:** A color profile with a very limited amount of color values, primarily designed for vivid images displayed over the Internet. Not suitable for print reproduction.

Artwork guidelines (Lancet) for successful images



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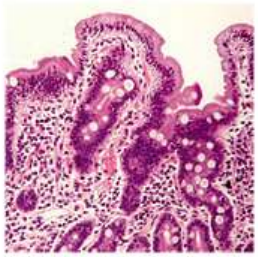

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have suitable detail and are
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Of 300 dpi

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Please don't subsequently
Enlarge your images in any software
As this causes the image to blur
Which we cannot fix.

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Lancet artwork guidelines for successful images

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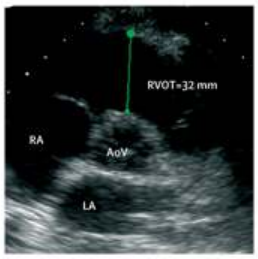

4

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imaging will yield a high quality
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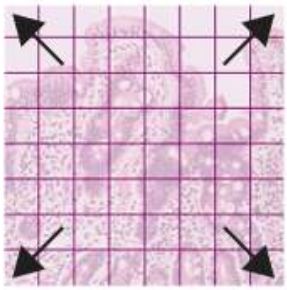
The reason you should supply high resolution images in quite simply a matter of quality. Your article will shine.



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A low resolution image fits into a wide weave gauze, which means it is really divided into large image

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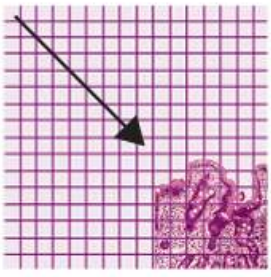

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4

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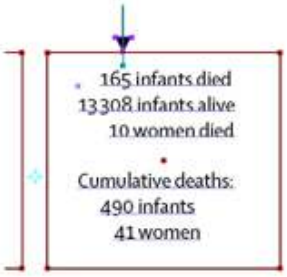

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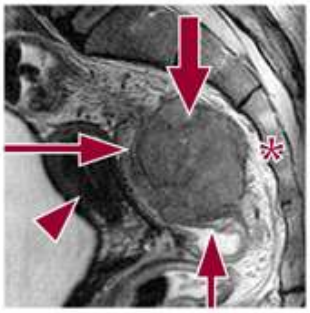
Make sure all text in submitted files is editable (shown in blue) so we can easily copy and paste to save time.



2

If supplying annotated images, also give us the unannotated versions so we can style them easily.

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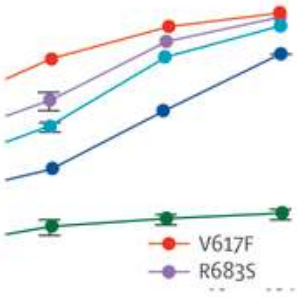
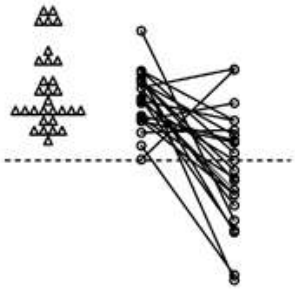


3

Ensure every aspect of your figures is absolutely legible, not to small, nor too ambiguous. Use distinct colors to make data clear.



4

Refrain from supplying confusing black and white figures whether it is difficult to see what's going on. Colors would help here.

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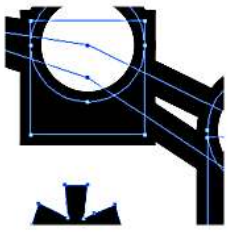
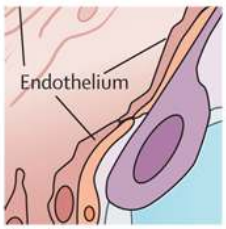


1

Supply vector art files. It mean we can immediately convert text and drawing elements (shown in blue) easily into our style. Pdf and eps files support vector editability

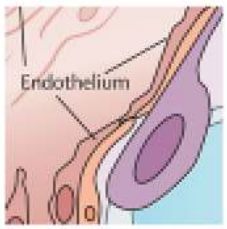
http://download.thelancet.com/flatcontentassets/authors/artwork_guidelines_flash.html

Lancet artwork guidelines for successful translation



2

Vector are characteristically retains its sharpness and will not pixelate upon screen magnification. All drawn details and text are preserved and can be edited.



3

Flat art has no drawing or text ready for us to immediately converted to style. As you can see it does pixelate on magnification denoting it is not vector art based.

4

Flat files are slow. You should be able to save from your mapping software or original digital art eps file or a pdf. These preserve editabilty from the original which is every useful.

http://download.thelancet.com/flatcontentassets/authors/artwork_guidelines_flash.html

Image file formats interests to authors

File Format	Pertinent Application
DICOM	PACS
JPEG	PowerPoint, web-based display
TIFF	Print output, journal publication
PSD	Print output, when arrows or labels are necessary
GIF	Web-based display
EPS	Vector graphics
PDF	Distribution, web-based or otherwise
PICT	Some Macintosh applications use this format though it is largely replaced by the other formats
PNG	New format, may replace JPEG eventually

Note.—PICT = PICTure; PNG = portable networks graphics; PSD = PhotoShop document.

LaBerge &, Andriole. *Digital* image processing: J Vasc Interv Radiol. 2003 Oct;14(10):1223-30.

Figure File Formats

- Preferred File Formats (vector files): AI, EMF, EPS, PDF, WMF, XLS.
- Author should understand that there may be unacceptable photomicrophic image file formats such as BMP, GIF, PCT, and PNG, to some specific journals.

JAMA. Guidelines for Figures in Accepted Manuscripts
http://jama.ama-assn.org/site/misc/ifora.xhtml#GuidelinesforFiguresinAcceptedManuscripts

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